



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/782,731	02/18/2004	Junichi Nakai	60893 (70840)	3390

21874 7590 08/18/2006

EDWARDS & ANGELL, LLP  
P.O. BOX 55874  
BOSTON, MA 02205

EXAMINER

RICHARDS, N DREW

ART UNIT PAPER NUMBER

2815

DATE MAILED: 08/18/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/782,731

Applicant(s)

NAKAI, JUNICHI

Examiner

N. Drew Richards

Art Unit

2815

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 20 June 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-13 and 15-18 is/are pending in the application.
- 4a) Of the above claim(s) 16-18 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13 and 15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 September 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election without traverse of Group I in the reply filed on 3/7/05 is acknowledged. Claims 1-11 along with linking claims 12-15 are examined herein.

### ***Claim Objections***

2. Claim 11 is objected to because of the following informalities: "a central axis" should be amended to "the central axis" since the central axis is previously recited in claim 1. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-6 and 8-15 are rejected under 35 U.S.C. 102(b) as being anticipated by JP 2000-164837.

In the following rejection, the examiner will at times rely upon a computer translation of JP 2000-164837. This translation was generated by the JPO website: <http://www19.ipdl.ncipi.go.jp/PA1/cgi-bin/PA1INIT?1100397386209>. This translation is used as evidence as to what is disclosed in the Japanese language document.

JP 2000-164837 discloses in figure 6 a semiconductor apparatus comprising:

Art Unit: 2815

- a light input/output portion 12 provided in an upper portion of a semiconductor substrate 11, the light input/output portion 12 having an opening region for light associated to the light input/output portion 12 to pass through (the opening is not labeled but is located between the inner edges of layer 5), the opening region having a central axis and being bounded by a light shielding layer 5 wherein a cross-section is asymmetric to the central axis (since the cross-section in claim 1 is not defined as the cross section as any particular layer or taken in any particular direction or plane this limitation is met by the reference, note that a cross section, for instance along a 45 degree angle in figure 6 which passes through the central axis is asymmetric);
- a transparent film 17 covering the opening region; and
- an interlayer lens 19 provided on the transparent film 17, the interlayer lens 19 positioned such that an optical axis of the interlayer lens 19 is parallel to a central axis of the opening region (since lens 19 is shown centered on the opening and is evenly curved, it's optical axis will be parallel to the center axis of the opening).

With regard to claim 2, the light input/output portion 12 includes a light receiving portion for receiving light.

With regard to claim 3, the transparent film 17 is provided with step portions so as to have a concaved surface, and the concaved portion covers the opening region (transparent film 17 has step portions over layer 5 such that it has a concave portion covering the opening region).

With regard to claim 4, the optical axis of the interlayer lens 19 is aligned with the central axis of the opening region.

With regard to claim 5, a refractive index of the transparent film is lower than a refractive index of the interlayer lens.

With regard to claim 6, the transparent film includes a silicon oxide film including at least one of phosphorous and boron (disclosed as being BPSG).

With regard to claims 8 and 9, the limitations in these claims are product-by-process limitations. In these claims, the processes claimed do not result in any structural difference over the prior art and thus the structure claimed is anticipated.

With regard to claim 10, JP 2000-164837 further discloses a transfer channel 14 provided so as to have a predetermined space from the light input-output portion, an insulating film 2 provided on the substrate, the light input/output portion and the transfer channel, a transfer electrode 3 provided so as to oppose the transfer channel via the insulating film, and an insulating film 4 provided with an opening for exposing the opening region of the light input/output portion and in which the step portions are produced by covering the transfer electrode.

With regard to claim 11, the optical axis of the interlayer lens is aligned with the central axis of the opening.

With regard to claim 12, JP 2000-164837 disclose in figure 6 a method comprising:

- forming a light input/output portion 12 provided in an upper portion of a semiconductor substrate 11, the light input/output portion 12 having an opening region for light associated to the light input/output portion 12 to pass through (the opening is not labeled but is located between the inner edges of layer 5); the opening region having a central axis;
- forming a light shielding layer 5 with an opening for exposing the opening region of the light input/output portion, the light shield layer 5 having a cross-section which is asymmetric to the central axis (since the cross-section in claim 12 is not defined as taken in any particular direction or plane this limitation is met by the reference, note that a cross section, for instance along a 10 degree angle in figure 6 which passes through the central axis is asymmetric);
- forming a transparent film 17 covering the opening region; and
- forming an interlayer lens 19 provided on the transparent film 17, the interlayer lens 19 positioned such that an optical axis of the interlayer lens 19 is parallel to a central axis of the opening region (since lens 19 is shown centered on the opening and is evenly curved, it's optical axis will be parallel to the center axis of the opening).

With regard to claim 13, forming the light input/output portion includes forming a light receiving portion for receiving light.

With regard to claim 14, JP 2000-164837 further disclose forming a light shield film 5 provided with an opening for exposing the opening region of the light input/output portion.

With regard to claim 15, the optical axis of the interlayer lens is formed aligned with the central axis of the opening.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP 2000-164837 as applied to claims 1-6 and 8-15 above, and further in view of JP 4-111354.

JP 2000-164837 fails to teach the transparent film including an organic high polymer film.

JP 4-111354 teach the use of an organic high-polymer film in a solid-state image pickup device. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the organic high-polymer film as the transparent film in order to take employ the film as a surface protective layer. Thus, it would have been obvious to combine these references to obtain the invention of claim 7.

***Response to Arguments***

7. Applicant's arguments filed 6/20/06 have been fully considered but they are not persuasive.

Applicant has argued that JP'837 does not teach the light shield layer being asymmetric about the center axis. First it is noted that claim 1 does not recite the light shield layer being asymmetric, merely that a cross section be asymmetric. Second, neither claim 1 or claim 12 specify at what plane or direction the cross section is taken at. As such, various cross sections at different angles are indeed asymmetric and thus read on the claimed invention.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to N. Drew Richards whose telephone number is (571) 272-1736. The examiner can normally be reached on Monday-Friday 9:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ken Parker can be reached on (571) 272-2298. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



Art Unit: 2815

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



N. DREW RICHARDS  
PRIMARY EXAMINER